Submitter No.	Submitter name	Support Oppose Neutral	Heard Yes/No/ Unclear*	Decision sought*	Submission summary
1	Adam Eason	Oppose	No	Decline	 Ecology assessment only included macroinvertebrate sampling in three locations in Central Otago district, none in Queenstown Lakes district and effects on that reach are unknown. Suitability of Ecology assessment for dredging is questionable due to samples being taken from shallower edge habitats while dredging is to occur at 2m – 15m. Identification of tributaries wider than 1m as exclusion zones is welcomed but suggests this does not adequately support mana whenua values. Recommend that disturbance of the bed and sedimentation be avoided in the vicinity of all tributaries. Requirement for an ecological management plan be prepared by a qualified ecologist to be included and reviewed annually. This could be as a condition of consent rather than part of the application. Concern about the presence of kanakana (lamprey) due to lack of surveying. Recent research indicates kanakana have been identified nesting under large boulders. Consider more research needed. Supports Cultural Impact Assessment submitted by Aukaha
2	Aukaha	Oppose	Yes	Decline	 Te Rūnanaga o Moeraki, Kāti Huirapa Rūnaka ki Puketeraki, Te Rūnanga o Ōtakou and Hokonui Rūnaka (Kāi Tahu) oppose the application. Note the following statements are a summary only and greater detail and explanation is given in the submission. The Ngāi Tahu Claims Settlement Act includes a statutory acknowledgement of association of Ngā Tahu with the Clutha River / Mata-Au, to recognise and give practical effect to Ngāi Tahu mana over taoka resources and cultural landscapes. The submission describes the whakapapa of freshwater, with all water seen to have originated from the separation of Raki and Papatūanuku and their continuing tears for one another. Water plays a significant role in the spiritual beliefs and cultural traditions. The condition of water is seen as a reflection of the health of

Papatūanuku. The submission advises that the loss and degradation of this resource through dredging is a significant issue for Kāi Tahu. The primary management principle for Kāi Tahu is the protection of the mauri of a resource from desecration, which can be done by altering the food or energy sources, water quality, habitat, flow and biotic interactions of the river system. The history of the Clutha River / Mata-Au is implicitly linked to impacts of mining, damming, abstraction and land use practices. Kā Rūnaka have responsibilities through whakapapa to act as kaitiaki and care for catchments as a whole. The Kāi Tahu ki Otago Natural Resource Management Plan 2005 is the principal resource management planning document for Kāi Tahu ki Otago and is an expression of kaitiakitanga. The unrelenting cultural imperative is to keep the mahika kai intact, to preserve its productivity and diversity of species, and to restore habitat for mahika kai species where this is degraded. Kāi Tahu has a cultural, spiritual, historic and traditional relationship with the Clutha River / Mata-Au. The wai is tapu, reflecting the mana of the mountains and carrying an intact mauri. There are numerous urupā and wāhi tapu associated with the waterbodies in the catchment. The submitter seeks the application be declined for the following reasons: • Terramark commissioned a cultural impact assessment of the proposal which has been included as part of the notified application, however, has not been updated to address the cultural impact assessment. • The Clutha River / Mata-Au is a significant waterway for Kāi Tahu, connecting the mountainous region with the lifegiving ecosystems of the coast. Mana whenua associations are found along the length of the river, including stories, memories, placenames and archaeological evidence. The awa has its own whakapapa. • The submitter believes there is insufficient evidence on the
The sadmitter selectes there is mountained evidence on the

					 effects on instream benthic environments and therefore on taoka species and their survival. Hokonui Rūnanga have taken a firm stance of opposing any suction dredging mining due to the unknown effects on benthic species, including ammocoetes (juvenile kanakana), kākahi from spat to adult, eggs of multiple fish species including kanakana and galaxids, and also migrating elvers. The NPSFM embeds Te Mana o te Wai as a fundamental concept in freshwater management. Kāi Tahu is unable to assess whether the proposal provides for the mauri of the Clutha River / Mata-Au and gives effect to Te Mana o te Wai. The application is focussed on the economic benefits and does not address effects on the health and wellbeing of the river. Inadequate information has been provided to enable mana whenua to assess whether the effects of dredging on wāhi tūpuna and ara tawhito, ecology and biodiversity, and archaeology will be addressed. Overall, Kāi Tahu are concerned the proposal perpetuates existing inequalities in environmental outcomes.
3	Aurora Energy Limited	Neutral	No (provided conditions are included)	N/A Conditions recommen ded	 Aurora Energy have overhead electricity lines at multiple locations within the subject site (Attachment 1). Support the inclusion of proposed conditions 14 – 16. Propose additional condition: 16(a). When vessels are performing work within 4 metres of electricity lines, the applicant and/or their contractors are to hold at all times, an active and approved Aurora overhead close approach permit.
4	Bendigo Managemen t Limited	Oppose	Yes	Decline	 Considers attitude to freshwater ways unsatisfactory. Consider the application should be measured against the National Policy Statement for Freshwater Management 2020. Concern there is reference to the last 10 years and back 100 years when damage to environment was not acknowledged. Consider we should be enhancing natural resources. Note the difference in river gradient between the lower Clutha

5	Bex	Oppose	Unclear	Decline	 (where applicant has quoted testing and experience) which is 52m fall over 48km, compared to Upper Clutha which is approximately 50m fall over 24km. Concerned about spread of lagarosiphon and consider no disturbance of the river should be allowed to minimise potential spread of the weed. Concern disturbance of river bed may affect flows downstream, including erosion at Bendigo Reach. Highlights the Bendigo Reach is used for recreational purposes and breeding ground for declining banded dotterels, also access to the riverbed area is through Oliver Road which is substandard for everyday traffic. Queried why the exclusion area including Bendigo is not removed from the application entirely and concerned it may be used for expediency. Concern sediment discharge is adding unfavourable conditions for aquatic habitat which includes threatened and at-risk species. Considers presence of this commercial activity will detract from the enjoyment of leisure activities (e.g. fishing, cycling, walking, duck shooters, water sports) and could pose a safety risk to water sports). Supports feedback from Hokonui Rūnaka who oppose all instream gold dredging applications. Concerned about diesel engines with wet exhausts that mix the
	Thornton				 engine exhaust gas with engine cooling water which is then discharged to the river. Consider the Clutha River / Mata-Au is a valuable and under-rated local resource and spends a lot of time recreating in this area. Concerned with amenity and natural character values.
6	Billee Marsh and Wayne Marsh	Oppose	Yes	Decline	 Concern that the Ecology assessment recognise the scope of work was limited to a singular site visit and a full range of the biota might night have been seen or recorded (including lagarosiphon which could exist in other locations). Concern about the potential for the dredge and tender movements to spread lagarosiphon major to establish in areas downstream.

7	Central Otago Whitewater Incorporate d	Oppose	Yes	Decline	 Consider the macroinvertebrate sampling is from a small snapshot of the river and is not representative of the mid-river area where dredging will occur. Support the conclusion of the Aukaha CIA – "overall, mana whenua are concerned that the current dredging proposal perpetuates existing inequities in environmental outcomes". Concerned about effects on recreational amenity and consider that having a dredge on the river will affect the nature experience of kayakers.
8	Contact Energy Limited	Neutral	No	N/A	 Contact Energy runs a native fish management programme aimed at facilitating native fish passage, habitat enhancement and population monitoring. Contact Energy has a trap and transfer programme where elvers are caught below the Roxburgh Dam and relocated above the Roxburgh, Clyde and Hāwea Dams; and a migratory eel fishing programme to facilitate downstream passage. Would like to know that any dredging activity will not undermine the integrity and outcomes of this programme. Contact Energy also have a programme to facilitate lamprey passage which is in its early stages with the intention to enhance lamprey recruitment. Would like to know that any dredging activity will not undermine the integrity and outcomes of this programme. Notes that Contact energy hold an Operating Easement from the Crown to enable activities associated with the generation of electricity and as part of the applicant obtaining the required LINZ authority Contact will need to provide approval. Interested in measures to manage impacts on migration pathways and general health of native freshwater fish species specifically longfin eel and lamprey.
9	David John Burton	Oppose	Unclear	N/A Conditions recommen ded	 Concerned about noise volume – The drone of an engine will be unsettling, and it will take weeks (at best) to traverse any part of the river. The river is deep and narrow around the residence and any noise on the river is amplified.

10	Delina	Oppose	No	Decline	 Considers noise volumes should be monitored constantly and if exceeded operation is to be ceased immediately and brought back into agreed limits. Concerned about fumes from a large diesel engine – at times the air is very still, and fumes will hang in and around river valley. Hours of work should be standard construction work hours of 7.30am – 6pm. Same as submission 1, 19, 31, 35 and 39, see summary in submission
	Rongokea	Оррозс	140	Decime	1.
11	Douglas Aubelle	Oppose	No	Decline	 Considers the dredging will damage ecology by directly affecting the habitat, disrupt riverine processes and distribute sediment. Considers the dredging will have visual and acoustic impact. Considers this is a beautiful and tranquil part of the river and industrial activity should not be allowed.
12	Dr Marilyn Duxson and Dr John Harris	Oppose	Yes	Decline	 Submitter lives and owns vineyard, winery with tasting room and visitor accommodation cottage adjacent to the Clutha River / Mata-Au. Opposes the application on five matters: 1. Effect on personal quality of life. The river is an integral party of the submitters everyday life and they have put considerable energy into excluding stock, removing weeds and promoting regeneration of endemic species. They, and visitors to the winery, use the river daily including for walking, swimming, camping and picnicking. This would be degraded by noise and diesel fumes from a dredge. The dredge operates at night and is floodlit which would materially destroy evening activities. There is already a large diesel used for extracting river water adjacent to the property which significantly impacts the enjoyment of the river environment. It is a similar level of noise to the dredge and the combination of noise from both sources would be much worse than one alone. The location of their property is downstream of a gravel pit

that was sluiced during the Otago Gold Rush so expect this section of the river would be a focus for gold extraction. 2. Effect on experience of national and international visitors o A cycle trail is proposed for construction along the riverbank from downstream of the Luggate Bridge to the head of Lake Dunstan. It is likely to be extremely popular. The trail is a chance to highlight the natural Central Otago environment and also the historic connection of Māori to the river. o Considers the presence of a noisy dredge goes against the 'clean, green' and cultural experience sought for visitors. 3. Environmental risks. Concern around spread of Lagarosiphon major. The e3 report did not describe the survey protocol or water level at time of survey. Considers more information on Lagarosiphon should be provided. Lagarosiphon can be propagated by small fragments and a dredge accidentally disturbing even a small amount of the weed is likely to have a severe downstream effect. It is not enough to say that the dredge will avoid the shallow water, because this is dependent on the water level. Areas of weed that are clearly apparent at low flows in summer are, at times off higher flow (such as mid-winter) submerged under 1 – 1.5m of water, not easily seen and fully accessibly to a dredge with 0.8m. Effects on native fish cannot be excluded given the huge extent of riverbed that will be disturbed and the very small area of riverbed sampled by e3. A true measure of biological life might be more effectively assessed by testing for e-DNA rather than spot-sampling. 4. Challenges the mauri of the river with no or little gain to community. Considers need to be protecting the increasingly rare, pure waterways, not continuing to exploit them for gains which

					 are negligible to the local community and nation (although may be substantial to the operator). To alter the natural environment by the addition of a dredge burning 5,000 L of diesel a week and making constant noise (7am – 10pm) at close to the 55 dB noise limit with noise may well exceeding on occasion. Support the Cultural Impact Assessment by Aukaha. In particular notes that mana whenua are concerned that the current dredging proposal perpetuates existing inequities in environmental outcomes.
13	Duncan Kenderdine	Oppose	Unclear	Decline	 Endorses submission 4. Considers applicant is using technology and impacts from 100 years ago. Little commentary or effort to reflect the decreasing health of the Clutha River / Mata-Au. Clutha River / Mata-Au is an Outstanding Natural Feature and Wahi Tupuna, considers it is inappropriate for an industrial activity to occur up to 13 hours a day for up to 10 years. Considers that because a smaller dredge is possible it does not automatically give a much larger dredge and associated effects a right to operate. Little acknowledgement of NPSFM in application.
14	Esther Water	Oppose	Yes	Decline	 Considers there is insufficient information to determine level of effect. Considers absence of evidence is not evidence of absence. Considers claims to the historic cultural values of the application are not appropriate and are outdated.
15	Gregory Dougherty	Oppose	Unclear	Decline	 Concerns relate to noise, disturbing the river bed, impact on recreational users (including fishermen, hunters, walkers, kayakers, rafters, swimmers and cyclists), impact on aquatic life (including insects and many fish species) and impacts on neighbouring residents sight and sound. Describes the application as 'environmental terrorism'.

16	Jaylene Harper	Oppose	No	Decline	 Very similar to submission 1, 10, 19, 31 and 39, see summary in submission 1 with following addition: The proposed economic benefits to not come close to the environmental damages. Environment should be considered first, not financial gain.
17	Jeff Forsee	Oppose	No	Decline	 Submitter is a local fishing guide. Considers it imposes serious implications regarding the health of the robust trout fishery in the area being upper Clutha River / Mata-Au, Lake Wanaka, Lake Dunstan and Cardrona and Lindis Rivers. Concerned with effects on water quality, habitat disruption, destruction and effects on spawning and therefore the future of the fishery. Spawning trout can be present in the river from May to November. Concerned that the presence and sound of the dredge will change amenity of the river, including thriving riparian zone, with it being a quiet, peaceful place to spend time. Concerned it will disrupt the fishing experience, including for visiting tourist anglers. Highlights that the river is used for recreational activities throughout the week, not just weekends and public holidays, including for kayaking, walking, hunting, fishing, rafting, swimming and generally enjoying the river. Describes that the Upper Clutha River / Mata-Au is a different river to the lower, with different gradient, braids, lake deltas and significantly less flow.
18	Jennifer Parr and Callum Grant	Oppose	Unclear	Decline	 Concerns relating to the alteration to the bed of the river and discharging contaminants from the engine and clouding of the water from sediment discharges. Considers the proposal will negatively impact people who recreate on the river (e.g. kayaking and fishing). Considers it will set a precedent for future commercial endeavours on the river. Consider the river should be protected, considers it a 'national treasure'.

19	Kelly Humphries	Oppose	No	Decline	- Same as submission 1, 10, 31, 35 and 39, see summary in submission 1.
20	Kim Fogelberg	Oppose	No	Decline	 Concerned that the dredge has two Detroit Diesel two stroke main propulsion engines. Describes: The vessel has wet exhausts that mix the engine exhaust gas with engine cooling water that is then discharged directly to the river. Advises that Detroit Diesel no longer manufacture these engines due to their negative environmental impact and they are no longer certified to operate in many parts of Europe and North America. Advises two stroke diesel engines produce a lot more pollution due to the fuel air mix being contaminated by the engine lubrication oil. Considers the engines are not fit for purpose.
21	Lucille Anna Ferrier	Oppose	No	N/A	 Recreates in the Clutha River / Mata-Au at Luggate, including fishing walking and enjoying the area. Concerned the commercial activities will spoil the Clutha River / Mata-Au for recreational activities. Considers riverbed should be left alone and not disturbed for commercial gain.
22	Mike Johnson	Oppose	Unclear	Decline	 Concerned with disturbance of the bed leading to silting and discolouration, destruction/disturbance of the food supply for fish population and destruction of natural habitats for aquatic life. Considers the dredge will be a hazard for other recreational river users, including rafters, kayakers, fishermen. Considers the noise will disturb the tranquillity of the river and reason people want to be in this environment.
23	Morgan, Nathan Hudson and Hank Weathingto n	Oppose	Unclear	N/A	 Submitters are active users of the Clutha River / Mata-Au for fishing, rafting and swimming. Concerned with the discharge of sediment, noting that while the effect is localised, as the dredge moves up and down the river the localised effect will be spread the distance of the permit over time. Considers the Clutha River / Mata-Au should be kept in a pristine state above Lake Dunstan and industry is minimal over this stretch.
24	Hellen Sola Ascough	Oppose	Yes	N/A	- Submitter lost part of property to Clutha River / Mata-Au in 2019/2020 due to erosion.

25	New Zealand Professional Fishing Guides Association	Oppose	Yes	Short duration so effects can be mitigated and monitored.	 Concerned with potential for erosion occurring along the true-left bank of the Clutha River / Mata-Au as a result of the disturbance of the bed, construction of slipways and discharge of sediment. Concerned with the disturbance of the riverbed, impact on the visual environment and impact to other river users. Oppose the disturbance of the natural environment that is used by members for tourism purposes. Proposes shortening the consent so the effects can be monitored and mitigated if possible.
26	Ngaio Hart	Oppose	Yes	Decline	 Considers need to protect rivers for humans to enjoy nature and recreate in, and to protect species that the river supports. Concerned with the destruction of ecosystems and effects on water quality. Concerned with the visual impact which will lessen wilderness experience for river uses. Concerned with use of Detroit Diesel two stroke main propulsion engines. Advises that the vessel has wet exhausts that mix the engine exhaust gas with engine cooling water that is then discharged to the river. Detroit Diesel no longer manufacture these engines and they are no longer certified to operate in many parts of Europe and North America. Two stroke diesel engines produce a lot more pollution due to the fuel air mix being contaminated by the engine lubrication oil.
27	Otago Fish and Game Council	Oppose	No	Recommen ds conditions	 Fish and Game is the statutory manager of sports fish and game bird resources within Otago, under the Conservation Act 1987. The submission is guided by the Sports Fish and Game Management Plan for Otago. The upper Clutha River / Mata-Au and the specific stretch where the activity will occur contains areas of significant habitat and spawning areas for sports fish. Fish and Game consider more can be done to mitigate impacts on the environment, particular relating to trout spawning and habitat. It is not appropriate for Fish and Game to provide information such

- as spawning and redd locations for a commercial operation, the resource burden would be too great.
- Fish and Game preferred outcome would be conditions that avoid adverse effects on spawning and avoiding redds.
- Conditions 20-23 be modified to remove the burden of resourcing from Fish and Game.
- If the following conditions were added, Fish and Game expects the application would be more consistent with the relevant planning documents and legislation:
 - During spawning (1 April 31 October), dredging should only occur at depths greater than 1m to prevent the disturbance of spawning trout.
 - There will be no visually conspicuous sediment plume beyond 100m downstream of the discharge.
- Fish and Game support the 20m exclusion zone around any tributary confluence greater than 1m in width.
- Fish and Game provided a map showing historic redd locations (see Attachment 2). They note that each location can represent multiple redds and that more redd locations will be present throughout the proposed mining area with the location changing from year to year. Fish and Game expects that there will be few locations where the applicant will find no spawning.
- Spawning trout along with redds, eggs and juveniles are sensitive to the type of disturbances that suction dredging will cause, including (but not limited to):
 - The physical disturbance of gravels, in which redds may be deposited or juveniles may be in hiding.
 - The discharge of previously settled sediment may move downstream and smother redds, juveniles or spawning gravels.
 - Changes to the structure of river habitat such as riffle, run, pool sequences.
- Fish and Game requests there be no visually conspicuous sediment plume beyond 100m downstream of the discharge.

					 Fish and Game reinforce there remains a great deal of uncertainty surrounding the impacts of suction dredging on aspects of freshwater ecology of the Upper Clutha River / Mata-Au, highlighted in the Cultural Impact Assessment prepared by Aukaha.
28	Penrith Holdings Limited	Oppose	Yes	Decline	 Submitter owns a property on Maori Point Road which fronts the river. Concerned that dredging will disturb the mud bottom of the river and affect fish and fauna. Gold of consequence is found under the mud pan, once disturbed this silt will encapsulate the banks and eddies, rather than the rock base experienced. Mud and silt will flow down river and affect the delta area, which in turn raises the flood plain (reference flood plain report). Considers it is probable that lagarosiphon exists in limited areas but is thick in the lake and will be spread more easily. Considers upper region of the Clutha River / Mata-Au should be left un-disturbed, concerned how long it takes for the river to recover and this is not the green image New Zealand sells to tourists. Supports the Cultural Impact Assessment prepared by Aukaha. Concerned the noise level and length of operating hours will be unbearable to residents. Consider it an unnecessary use of fossil fuels and generated carbon.
29	Phillip John Wilson	Support	Yes	Grant	 Supports the application to dredge this part of the river. Support is based on 15 years' experience gold dredging on the Clutha River and 12 years dredging in Lake Wanaka, and dredging in Lake Dunstan and many lakes in the North Island to remove Lagarosiphon and other invasive weed species.
30	Rob van der Mark	Oppose	Unclear	N/A	 Concerned with effects on the environment including disturbing the riverbed, impacting water turbidity, noise in the river gorge and impacts on fish and birds. Does not consider the effects outweigh benefits to the community. Considers need to stop negatively impacting the environment when any benefits go largely to out of the area owners.

31	Robert Olerenshaw	Oppose	No	Decline	-	Same as submission 1, 10, 19, 35 and 39, see summary in submission 1.
32	Serge A Bonnafoux	Oppose	Unclear	Short duration so effects can be mitigated and monitored.	-	Submitter is a fishing guide. Considers the proposal will have an impact on the visual environment and disturb the scenic environment that is provided to tourist anglers. Concerned it will disturb the river bed with consequence on living creatures and water quality. Seeks duration is reduced as much as possible to monitor effects and mitigate if possible.
33	Stefan Austin	Oppose	Unclear	Decline	-	Submitter uses the Clutha River / Mata-Au 25 days a year to teach students raft guiding, white-water kayaking and white-water rescue skills. Considers the proposal puts students and other river users at risk.
34	Stephen Jack	Support	Unspecified	N/A	-	Considers Aukaha's opposition (as presented in ODT) to be extreme. Considers the largest impact on native species is the Roxburgh and Clyde dams, with the impediment they present to migratory species and the sediment loads discharged when flushing, followed by discharges of treated wastewater to the river. Considers gold mining is a traditional and economically important activity in Otago and should be encourage.
35	Timothy Eason	Oppose	No	Decline	-	Same as submission 1, 10, 19, 31 and 39, see summary in submission 1.
36	Todd Adolph	Oppose	Unclear	N/A	-	Consider the operation will be a deterrent to nature lovers who enjoy the area for peace of mind. Consider it would impact the fishery, by destroying the stream bed and insects that make the ecosystem thrive. Seeing and hearing the barge would be a form of pollution.
37	Anthony Ohau Ward- Holmes	Oppose	Yes	Decline	-	The applicant has not provided sufficient information to determine the level of effects of the proposed activity.
38	Paddle Wanaka Limited	Oppose	Unclear	Decline	-	Same as submission 5, see summary in submission 5.

39	Emmilee Fendall Leech	Oppose	No	Decline	- Same as submission 1, 10, 19 and 35, see summary in submission 1.
40	Oliver Moon	Oppose	Yes	N/A	 Submitter is an ex-employee. The main hydraulic motor discharges directly to the Clutha River / Mata-Au (there is no sump), which occurs to let air into the room as there is a fan which sucks air out of the room via a radiator. A lot of oil leaks from the motor directly into the river. When the bilge is vacuumed all contents are thrown overboard. There is no-where on board to store or hold toxic substances. Submitter has heard stories on multiple occasions of thousands of litres of diesel being discharged to the Clutha River / Mata-Au. They consider this is because the fuel tank system is badly designed and if the person forgets to switch the transfer pump off when transferring from one side to the other it keeps pumping- until the fuel tank is full and goes out via the overflow/breather. An egg timer is used as a reminder. The six main fuel tanks are old 1,000L HDPE plastic intermediate bulk containers (IBCs) which should not be used in this situation. The jetboat is supposed to be removed every time it is refuelled but it isn't. The hydraulics leak constantly. Considers the anchoring is dangerous – tied to both sides of the river sometimes directly blocking it with steel cables strung across the river as the anchors will not hold it. There is no oil-on, oil-off procedure and concerned the boats are not surveyed as they are supposed to be.
41	Land Information New Zealand	Neutral	Unspecified	N/A	 LINZ provides written approval for the purposes of s95 of the RMA only. It is not indicative of any associated arrangement with the Commissioner of Crown Lands or other statutory approval which may be required from LINZ in relation to the proposed activity. Authorisation from the Commissioner of Crown Lands to undertake the activities on land owned or administered by LINZ is required. Authorisation from Contact Energy and Ngāi Tahu will also need to

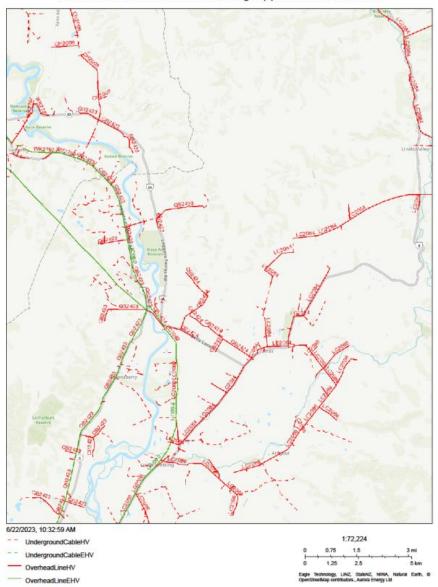
	be sought.	

^{*}Unclear – submitter has said they do not wish to be heard in support of their submission, however has said that if others make a similar submission they will consider presenting a joint case with them at a hearing.

^{**} The decision sought by the submitter has only been included if the submitter has made it clear in their submission their requested decision using words like decline, reject, denial, grant, accept, etc. Where this hasn't occurred, a status of 'N/A' has been included.

Attachment 1: Aurora Energy Limited

Aurora Overhead Lines Crossing Upper Clutha Mata-Au



Attachment 2: Fish and Game

Note: Each location marked on this map can represent multiple redds, and that unidentified redds will be present throughout the waterbody with their location changing year to year.

